Brief introduction of allowed pesticides used in Organic farming

According to the regulation of 834/2007. article 12., and article 15.
With harmony of the 889/2008 EU regulation article 5. according to article 12.
According to article 9. of 834/2007 documentation of GMO free status of the applied product

Pest control products

The following products are the most important among those authorized in the EU Regulation on Organic Farming. However, their use in organic farming must be considered a last and obligatory alternative. Priority must always be given to correct agricultural and soil fertilization practices. There are many substances and products available for plant protection. In this text, however, we will refer only to those authorized by the EU Regulation. The substances are divided in two groups: those protecting against fungal and bacterial diseases and those suitable for the control of insects and mites. This distinction, however, is not so clear-cut due to the secondary effects of some products.

Products protecting against insects and mites

AZADIRACHTIN (Extract from *Azadirachta indica* – Neem tree)

General information

Azadirachtin is extracted from the Asiatic tree *Azadirachta indica* (or "Neem tree") and is one of the many active compounds known as limonoids produced by this tree. Other Neem tree limonoids are azadirachtin, salannin, nimbin and nimbidin, all of which are found throughout the tree, with higher concentrations in the kernel (0.1-1% of azadirachtin). In Asia and Africa, parts of this tree are widely used to prepare pharmaceuticals, food, cosmetics, and pesticides.

Use

Azadirachtin is used as an insecticide. It acts through ingestion and operates as antagonist to the ecdysone hormone, impeding the molt of insects. It is inactive on eggs and adults and operates as an antifeedant on certain insects.

Range of activity

Azadirachtin has a wide range of activity, including Homoptera, Lepidoptera, Diptera, Coleoptera and others, mites included. It also has a demonstrated effect against fungi and bacteria.

Field of application

Used in horticulture, fruit trees, nursery and ornamental plants.

Toxicity

Practically non-toxic to vertebrates.
The Neem oil (fo) can be phytotoxic in large doses.

Dose and compatibility

Approximately 25-50 g/ha of Azadirachtin, depending on the formulas used; this can be used in combination with Pyrethrins, viruses, Bt or soft soaps.

PLANT OILS (Mint oil, pine oil, caraway oil)

General information

Plant oils are a mixture of natural substances derived from various parts of plants such as flowers, seeds and fruit. They contain mostly oleic and linoleic acids. Traditionally, plant and mineral oils were used as fungicides and pesticide carriers, improving distribution and duration.

Use and effects

Plant oils are used as insecticides, provoking asphyxia in insects and their eggs. They also act as repellents.

Range of activity

Active against aphids, Coccidae, Diaspididae and mites.

Field of application

Viticulture, fruit trees, horticulture.

Toxicity
Low toxicity to mammals. Plant oils are not specific and may cause loss of antagonist insects in large doses.
Dose and compatibility
Usually 200-300 ml/hl as additive and 1-3 g/hl as insecticide, depending on preparation.
Plant oils can be mixed with most organic farming preparations.

PYRETHRINS (Extract from *Chrysanthemum cinerariaefolium*)
General information
Pyrethrins are natural insecticides derived from plants of the genus *Crysanthemum*, with cultivated mainly in Kenya, Tanzania and Tasmania. Flowers are collected after blooming, then dried and milled. The active compounds are a mixture of six molecules known as Pyrethrins, which are photosensitive and rapidly oxidized if exposed to air and light. To increase their stability, some formulas contain substances which act as stabilisers (e.g. PPBO piperonilbutoxyd).
Use
Pyrethrins operate as contact insecticides, attacking the nervous system and paralysing the insect in a few seconds (known as the knockdown effect). Depending on the dose used, death can follow. Some insects eventually metabolise Pyrethrins and recover. Because of this, Pyrethrins can be activated with PPBO, which inhibits detoxification of the active compound and improves the efficiency of treatment.
Range of activity
Pyrethrins are effective against a wide range of insects (e.g. Homoptera, Lepidoptera, Diptera Coleoptera) and relatively active against mites.
Field of application
Horticulture, ornamental plants and for the conservation of foodstuffs.
Toxicity
Low toxicity to mammals, but highly toxic to fish, reptiles and amphibians. Pyrethrins are nonselectiv insecticides and can therefore be harmful to bees and other beneficial insects. They are not phytotoxic.
Dose and compatibility
Usually 70-100 ml/hl.

QUASSIA (Extract from *Quassia amara*)
General information
Quassia is a natural insecticide derived from the *Quassia amara* tree indigenous to Suriname or from *Picrasma excelsa* (Jamaican Quassia). The active compounds are quassin and neoquassin. Quassia is used as a repellent to dogs and cats and also as a medicinal plant.
Use
Quassia operates on the nervous system through both contact and ingestion. Its activity is relatively weak, due to its limited persistence. On locusts it has a phagodeterrent effect.
Range of activity
Active against aphids and sawflies.
Field of application
Horticulture, fruit trees, viticulture, silviculture, ornamental plants.
Toxicity
Low toxicity.

ROTENONE (Extract from *Derris spp., Lonchocarpus spp.* and *Tephrosia spp.*)
General information
Rotenone is an alkaloid and was first isolated in 1895. It is extracted from the roots of some tropical plants of the Leguminosae family, e.g. *Derris elliptica, Derris spp., Lonchocarpus utilis,*

Tephrosia spp. Rotenone rapidly decomposes upon exposure to light and air. Its persistence is therefore limited to two to three days in summer and five to six in spring.

Use

The active compound is more toxic through inhalation than ingestion. The degree of powder fineness is crucial in determining the level of toxicity. Rotenone can be stabilised with phosphoric acid and acts through contact and ingestion, inhibiting the mitochondrial electron transport.

Range of activity

Rotenone has a wide range of activities: aphids, thrips, Lepidoptera, Diptera, Coleoptera, etc. It is also relatively active against mites.

Field of application

Horticulture, fruit trees, ornamental plants, mosquitoes and flies. Rotenone is also used in veterinary medicine to fight *Hypoderma* flies.

Toxicity

Rotenone has low toxicity to mammals, while it is extremely toxic to fish. It is a nonselective insecticide and is not harmful to bees.

Dose and compatibility

Generally 100 g/ha of the active compound in horticulture. The waiting period is ten days. Rotenone is incompatible with alkaline substances.

GRANULOSIS VIRUS (*CpGV*)

General information

This virus was first isolated in Mexico in a *Cydia pomonella* larva. CpGV is used against the *Cydia pomonella* in apples and also seems to be effective against other Lepidoptera.

Use

CpGV operates through ingestion. For this reason it must be applied on larvae of Cydia at the correct time. Ultraviolet rays can deactivate the virus, thus spraying the compound around dusk or early morning is recommended.

Range of activity

This virus is specific for six species of *Tortricidae*, the most important being *Cydia pomonella*.

Field of application

Apple, pear and walnut trees.

Toxicity

Strictly specific compound harmless to other insects. It is not phytotoxic.

Dose and compatibility

Must not be mixed with other alkaline-sensitive substances.

BACILLUS THURINGIENSIS

General information

In organic farming, *Bacillus thuringiensis* is the most widely used bacterial preparation. The bacterium occurs naturally in the soil, and its insecticide properties are known since the 1960s. Many varieties of Bt exist and is used in many fields. During sporulation, the bacterium produces toxins (most importantly delta-endotoxin) which represent the active compound of the formula. Pro-toxins are activated within the insect's intestine and become lethal.

Preparation is selective and harmless to vertebrates due to the acid reaction in the intestine.

Use

Bt is active only through ingestion. For this reason, it is sprayed on harmful insects during the larva stage, when they are feeding on the surface and are exposed.. Once the toxin is released inside the intestine, the entire digestive tract becomes paralysed and the insect is unable to feed. Death occurs in a matter of hours to a maximum of three days.

Range of action

The different varieties of Bt are specific to certain families or species of insects:

Bacillus thuringiensis var *kurstaki* is active against many species of Lepidoptera;
Bacillus t. var *tenebrionis* is active against some species of Coleoptera (e.g. the potato beetle); and *Bacillus t.* var *israelensis* is active against mosquitoes.

Field of application

Horticulture, viticulture, fruit and olive trees, ornamental plants, silviculture.

Toxicity

Nontoxic to vertebrates. It is highly specific, posing no danger to other insects, and is not phytotoxic.

Dose and compatibility

Generally from 0.5 to 2 kg/ha in commercial preparations, depending on the formula. It must not be mixed with alkaline fertilisers or crop protectants.

FATTY ACID POTASSIUM SALT (*Soft soap*)

General information

This product, also known as potassium soft soap or Marseille soap, is obtained by mixing vegetal oils with alkaline substances such as soda and potassium hydroxide. Aside from its widespread use as a detergent, this product is also used in agriculture as an insecticide.
One of its important properties is its completely biodegradability, as bacteria in the soul metablised it.

Use

Potassium salt is used as an insecticide, an additive to other crop protectants and also against fungi and weeds. Mixed with other insecticides such as rotenone and Pyrethrins, it improves the adherence and persistence of the solution. Soft soap acts as a direct contact insecticide, damaging the insect's cuticle with soft tegument, and is also used for washing away honeydew and the waxy excreta of certain aphids.

Range of activity

Soft soap is used against phytophagous insects with soft exoskeletons, e.g. aphids, thrips and aleurodids. It is also active against mites.

Field of application

Apple, pear, peach, grapevine, aromatic herbs, vegetables and ornamental plants.

Toxicity

No toxicity to vertebrates and pollinator insects is known.

Dose and compatibility

Dosage of soft soap mixed with other insecticides is around 300 g/hl or 1000 g/hl is used alone. This product should not be used in hard water.

LIME SULPHUR (*CALCIUM POLYSULPHIDE*)

General information

Calcium polysulphide is used as an insecticide and fungicide. Barium polysulphate is also used in agriculture but is forbidden in organic cultivation. The active compound is different forms of sulphur.

Use

As an insecticide, it acts through direct contact, due to the causticity of the preparation. It is also efficient in partially dissolving cochineal shields. A secondary effect of this insecticide is asphyxia.
Polysulphide is also active as a fungicide because of the presence of sulphur.

Range of activity

Lime sulpher is used against Diaspididae (*Quadraspidiotus perniciosus, Diaspis pentagona* and *D. leperii*) and against the eggs of mites. It protects crops from oidium, peach blister canker and other diseases.

Field of application

Citrus, peach, apple, pear, apricot, cherry, grapevine and olive tree.

Toxicity
The substance is irritating if inhaled or comes into direct contact with eyes or skin. Polysulphides are also toxic to some predatory mites. Due to their alkalinity, they can be phytotoxic, inducing burns in the vegetative organs. For this reason their use is preferred during winter.
Dose and compatibility
For winter treatments, a 16-17 kg/hl dose of drupaceous and 20-22 kg/hl for apples or pears is suggested. Calcium polysulphide is highly corrosive to spraying gear, which therefore should be thoroughly washed after use.

MINERAL OILS (*White, paraffin, petroleum oils*)
General information
Mineral oils have been used since the end of nineteenth century. They are derived from the fractional distillation of petrol at high temperatures, hydrogenation and a final extraction with solvents. Extraction conditions highly influence the composition and agronomic impact of mineral oils.
Use
Mineral oils induce asphyxia, suffocating insects and their eggs. They are also active as repellents for feeding or egg depositing.
Range of activity
Mineral oils are active through direct contact mostly against small insects, such as Diaspididae, Coccidae, aphids, psylla and mites. Due to their phytotoxicity, mineral oils can also be effective against oidium and weeds.
Field of application
Fruit trees, horticulture, ornamental plants and in nurseries.
Toxicity
Very low to mammals, mineral oils can cause problems to other insects when sprayed.
Dose and compatibility
As an insecticide, 1-3 kg/hl and 200-300 ml/hl as additive. Waiting period 15-20 days. Incompatible with sulphur.

SUBSTANCES USED IN TRAPS
PHEROMONES
General information
Pheromones are compounds produced by insects and are used for chemical communication among individuals of the same species. They affect behaviours such as aggregation, sexual interaction and warnings. They can be artificially produced in the laboratory and serve different purposes in agriculture, e.g. monitoring and pest control, being used as attractants in traps together with insecticides.
Use
Monitoring: pheromones are added in traps to attract and investigate the presence of insects (e.g. lepidoptera).
Mass trapping: the objective is to avoid mating, capturing the males of a specific species in a trap baited with an approved insecticide (i.e. only some pyrethroids in organic agriculture). It is suitable for Lepidoptera and Diptera such as the olive fly.
Sexual confusion: The objective of pheromone use is to avoid mating, spraying large quantities of pheromones in order to confuse male members.

DIAMMONIUM PHOSPHATE
This fertilizer is used as bait for the mass trapping of fruit and olive flies. Adult flies are attracted by the ammonium odor.

HYDROLYSED PROTEINS

General information

Hydrolysed proteins are used as attractants only in combination with insecticides. They are used to control olive and Mediterranean flies (*Batrocera oleae* and *Ceratitis capitata*) during the adult, when the insects need proteins for their diet.

Use

Used as an attractant compound. The insects are killed by the pesticide mixed with proteins.
In organic agriculture, it is allowed only if used in traps with bio-pesticides and certain pyrethroids.

Range of activity

Bactrocera oleae, Ceratitis capitata, Ragholetis cerasi.

Field of application

Olive, citrus and cherry trees.

Toxicity

Hydrolysed proteins do not have an impact on the environment. Possible drawbacks are related to the type of insecticide with which they are combined.

Dose and compatibility

1% solution.

PYRETHROIDS (deltamethrin and lambda-cyhalothrin only)

General information

Pyrethroids are synthetic pesticides similar to the natural pesticide Pyrethrins. Their molecules are stable to light (Pyrethrins are not) and soluble in organic solvents. For this reason, they are much more persistent than their natural relatives.

Use

Pyrethroids operate through contact and ingestion, killing the insect within minutes.
Their use in organic agriculture is permitted only in traps for olive and Mediterranean flies.

Range of activity

A wide range of insects are sensitive to Pyrethroids, e.g. Coleoptera, Lepidoptera, Diptera, locusts, grasshoppers and ticks.

Field of application

Fruit and olive trees.

Toxicity

Relatively low to mammals but high to fish and pollinators.

Dose and compatibility

Usually the product is already inside the trap.

4. Products against cryptogamic diseases

COPPER

General information

Copper-based products are widely used for their fungicide and bactericide properties. A wide range of copper-based formulas are used in agriculture, i.e. copper sulphate, hydroxide, oxychloride and cuprous oxide. The active compound of these formulas is the copper ion (Cu^{++}). Copper is active through direct contact, inducing denaturation of enzymes and proteins of the cell membrane. It also inhibits spore germination.

Use

The persistence and efficiency of the treatment depends on the solubility and adhesiveness of the product used. On adhesiveness, the most widely used formulas are classified as sulphate, hydroxide, oxychloride or carbonate. In order to increase adherence, bentonite can be added to the copper product.
As regards solubility, products are classified as oxychloride and carbonate, hydroxide, or sulphate.

Range of action
Copper is effective against a wide range of fungal diseases, e.g. peronospora, peach blister and other fungal diseases. It is relatively active also against bacteriosis. Copper can be phytotoxic if distributed in inappropriate climate conditions (i.e. with temperatures under 10°C and wet), on sensitive varieties (peach and other stone fruits) and during the wrong vegetative phase (when leaves and branches are immature) of the plant. For example, spray coppering during flowering is not recommended.
Field of application
Viticulture, fruit trees, olive, beet root, horticulture and flowers.
Toxicity
Copper products are not dangerous to warm blood animals but are toxic to fish and other animals. Copper is not easily degradable and also tends to accumulate in water deposits. For this reason, the use of copper in organic farming needs to be reduced in spite of its importance.
Dose and compatibility
Doses vary considerably depending on the different formulas; up to 6 kg copper per ha per year for perennial crops, Member States may, by derogation from the previous paragraph, provide that the 6 kg copper limit can be exceeded in a given year provided that the average quantity actually used over a 5-year period consisting of that year and of the four preceding years does not exceed 6 kg
The waiting period is 20 days. The addition of sulphur, lime sulphur, mineral oils or *Bacillus thuringiensis* is not recommended.

POTASSIUM PERMANGANATE
General information
Potassium permanganate is a violet salt with fungicide properties. This energetic **oxidant** compound is soluble in water and is also used as a disinfectant. The active compound is potassium permanganate ($KMnO_4$).
Use
Potassium permanganate operates through contact, oxidizing all organic materials. Its effect is rapid, but its persistence is weak. It is used as a fungicide, bactericide and against mollusks.
Range of activity
Potassium permanganate is used for the protection of plants against oidium, fusarium (the Cucurbitacae family), peronospora, verticillium (the Solanaceae family) and Phomopsis cane.
Field of application
Horticulture, viticulture, fruit trees.
Toxicity
The concentrated product is caustic. No information on selectivity is available. It is highly phytotoxic and spraying green vegetation with more than 300 g/hl is not advisable.
Dose and compatibility
For winter treatments to fruits and grapevines, 1-2 kg/hl; for grapevine Phomopsis cane and leaf spot, 750 g/hl at sprouting; for oidium, 100-300 g/hl; and for fusarium, 500 g/hl for soil treatment.
Potassium permanganate should not be mixed with organic substances (e.g. rotenone, Bt) due to its corrosiveness.

SULPHUR
General information
Sulphur is widely used as a fungicide because of its limited environmental impact, low cost and polyvalence. Sulphur is a compound extracted in quarries or obtained from the separation of sulphur hydrogenate from natural gas during the purification process.
Use
Sulphur is a fungicide with a secondary action against mites. Because of its liposolubility, it can

penetrate fungal cells, dehydrating them.
Sulphur can be used in different preparations, classified in two different types:
Powder Sulphur:
• Raw sulphur: low percentage of sulphur, high adherence;
• Ground and ventilated sulphur (diameter 10-200);
• Refined and sublimated sulphur (diameter 5-25), very fine and active;
• Activated sulphur;
• Copper sulphur: ground and mixed with copper salts.
Wettable Sulphur:
• Common wettable sulphur;
• Sulphur with bentonite;
• Micronized sulphur (diameter 3-5);
• Colloidal sulphur (diameter 2-6) very active, but also phytotoxic.

Range of activity

Sulphur is effective against oidium in almost all crops, fusarium, sclerotinia, grapevine excoriosis, rust, alternaria and other fungal diseases.

Field of application

Grapevine, stone fruits, apple, pear, olive, hazelnut, citrus, horticulture, potatoes, cereals and flowers.

Toxicity

Sulphur is not toxic to mammals, while it is toxic to certain insects (such as Hymenoptera). It is an eye irritant and therefore caution should be exercised when spraying. In organic farming, sulphur should be used without selenium.
Due to their phytotoxicity, very fine sulphur products can be harmful to plants at high temperatures.
Powdered sulphur is less phytotoxic.

Dose and compatibility

Dosage depends on the type of sulphur. Indicatively, for powdered sulphur: in 25 g/hl (sublimated) or 40 g/hl if unrefined. For wettable varities, colloidal sulphur doses are 100-200 g/hl and 200-500 g/hl for micronized sulphur.
Sulphur is incompatible with mineral oils and crop protectants with alkaline reaction.

LECITHIN

General information

The term lecithin generally defines a group of phospholipids. These compounds are extracted from soyabean principally, but also from sunflower, rapeseed and eggs. Lecithin is widely used in the food processing industry as an emulsifier, stabiliser and antioxidant.

Use and effects

Lecithin is a fungicide that operates through direct contact. Its activity seems to be related to the inhibition of spore germination.

Range of activity

Oidium

Field of application

Cucumber, apple trees, ornamental plants

Toxicity

Nontoxic to humans, insects and plants.

Dose and compatibility

Depends on formulation. Lecithin can be mixed with the majority of products used in organic agriculture.

I. Substances of plant and animal origin

Name	Description; compositional requirements; conditions for use
Azadirachtin extracted from„*Azadirachta indica*(Neem tree)	Insecticide Need recognised by the inspection body or inspection authority
* Beeswax	Pruning agent
Gelatine	Insecticide
* Hydrolised proteins	Attractant; only in authorized applications in combination with other appropriate products of this Annex II. part B
Lecithin	Fungicide
Plant oils (e.g. mint oil, pine oil, caraway oil).	Insecticide, acaricide, fungicide and sprout inhibitor.
Pyrethrins extract from„*Chrysanthemum cinerariaefolium"*	Insecticide; Need recognised by the inspection body or the inspection authority.
Quassia extracted from *Quassia amara* .	Insceticide, repellent
Rotenone extracted from *Derris spp.* and *Lonchocarpus spp.* and *Terphrosia spp.*	Insecticide; Need recognised by the inspection body or the inspection authority.
* (*) In certain Member States the products market with (*) are not considered as plant protection products and are not subject to the provisions of the plant protection products legislation.	

II. Microorganisms used for biological pest control

Name	Description; compositional requirements; conditions for use
Microorganisms (bacteria, viruses and fungi) e.g. *Bacillus thuringensis, Granulosis virus,* etc.	Only products not genetically modified in the meaning of Directive 90/220/EEC.

1. Substances to be used in traps and/or dispensers

General conditions:
— the traps and/or dispensers must prevent the penetration of the

substances in the environment and prevent contact of the substances with the crops under cultivation.
— the traps must be collected after use and disposed of safely

Name	Description; compositional requirements; conditions for use
* Diammonium phosphate	Attractant; only in traps
Pheromones	Attractant; sexual behaviour disrupter; only in traps and dispensers.
Pyrethroids (only deltamethrin or lambdacyhalothrin)	Insecticide; only in traps with specific attractants; only against *Batrocera oleae* and *Ceratitis capitata wied;* need recognized by the inspection body or inspection authority.
* *) In certain Member States the products market with (*) are not considered as plant protection	

III a. :**Preparations to be surface-spread between cultivated plants**

Name	Description; compositional requirements; conditions for use
Iron (III) ortophosphate	Molluscicide

2. Other substances from traditional use in organic farming

Name	Description; compositional requirements; conditions for use
Copper in the form of copper hydroxide, copper oxychloride, (tribasic) copper sulphate, cuprous oxide	Fungicide 6 kg/ha metallic copper active ingredinent Need recognised by the inspection body or inspection authority
* Ethylen	Degreening bananas, kiwi and khaki plum, ripening of pine apple Need recognised by the inspection body or inspection authority
Fatty acid potassium salt (soft soap)	insecticide
(*) Potassium alum (Kalinite)	Prevention of ripening of bananas
Lime sulphur (calcium polysulphide)	Fungicide, insecticide, acaricide;

Name	Description; compositional requirements; conditions for use
Copper in the form of copper hydroxide, copper oxychloride, (tribasic) copper sulphate, cuprous oxide	Fungicide 6 kg/ha metallic copper active ingredinent Need recognised by the inspection body or inspection authority
* Ethylen	Degreening bananas, kiwi and khaki plum, ripening of pine apple Need recognised by the inspection body or inspection authority
Fatty acid potassium salt (soft soap)	insecticide
	need recognised by the inspection body or inspection authority.
Paraffin oil	Insecticide, acaricide
Mineral oils	Insecticide, fungicide; only in fruit trees, vines, olive trees and tropical crops (e.g. bananas); need recognized by the inspection body or inspection authority.
Potassium permanganate	Fungicide, bactericide; only in fruit trees, olive trees and vines.
(*) Quartz sand	Repellent
Sulphur	Fungicide, acaricide, repellent
(*) In certain Member States the products market with (*) are not considered as plant protection products and are not subject to the provisions of the plant protection products legislation.	

V. Other substances

Name	Description; compositional requirements; conditions for use
Potassium hydrixide	Fungicide; Only in fruit trees including tree nurseries for the treatment of *Nectria galligena*

Designing the crop rotation

The shortest period after the same crop may be sown again

Biokontroll Hungária Kht

Arable crops		Vegetables		Herbs and spices	
Crop	Years	Crop	Years	Crop	Years
Barley	3	Brussels sprouts	4	Savory	2
Beans	4	Broccoli	4	Pepper grass	4
Sainfoin	4	Red beet	4	Lemon balm	4
Crimson clover	3	Chick peas	4	Hollyhock	3
Peas	4	Zucchini	4	Hyssop	4
Potato	4	Headed cabbage	4	Thyme	4
Wheat	2	Lettuce	3	Marigold	2
Chicory	4	Garlic	4	Majoram	2
Sorghums	2	Watermelon	4	Coriander	4
Lupine	4	Rooted celery	5	Caraway	4
Sugar beet	4	Celery	4	Fennel	3
Peanut	3	Cauliflower	4	Lovage	4
Cow peas	3	Savoy cabbage	4	Milk thistle	2
Hemp	3	Early potato	3	Malva sylvestris ssp. mauritiana	3
Millet	2	Fig leaf squash, pumpkin	3	Clary sage	3
Corn	2	Pepper	4	Angelica	3
Lentils	4	Tomato	4	Valerian	3
Field beans	4	Parsnip	4	Foxglove	2
Alfalfa	4	White bush scallop	4	Safflower	2
Poppy-seed	3	Parsley	5	Leuzea	4
Mustard	3	Radish	3	Mullein	3
Sunflower	5	Melon	5	Large-flower evening primrose	3
Kidney vetch	3	Carrot	4		
Oil flax	6	Asparagus	4		
Oil radish	3	Field pumpkin	3		
Oil squash	3	Aubergine	3		
Buckwheat	3	Cucumber	4		

Rape	4	Butter beet	3
Castor-bean	4	Onion	4
Rice	2		
Common flax	4		
Rye	2		
Broomcorn	4		
Bird’s-foot trefoil	4		
Chickling vetch	4		
Soybeans	4		
Feeding cabbage	5		
Feeding savoy cabbage	5		
Feeding beet	4		
Feeding squash	3		
Turnip	4		
Spring feeding rape	3		
Triticale	2		
Red clover	4		
Oat	2		